Southern African ZSOAWA Antique Wireless Association

A Member of the SARL

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Newsletter

10th Anniversary

119

Jan 2016

Inside this issue:

Reflections:

How time flies when you're having fun. The Newsletter is now in its 10th year having made a very meagre start in January of 2006 with a bumper issue of two pages.

Since then it has grown, not only due to my own efforts, but to the efforts of all those who contribute articles to fill the pages every month.

I must admit, there have been times when I have seriously considered throwing in the towel, but with encouragement from many, we have kept it going all this time.

With the AWASA membership now reaching all corners of the globe due to a readership of some 260 people, from New Zealand all the way through to the USA (that is going from East to West). It just goes to show that Amateur Radio has far reaching effects, bringing people together from all parts of the globe.

This month I have had a glut of articles to choose from, thus a bumper issue, for me anyway.

It leaves me with something for the February issue as well.

So a new year has gotten underway, a New President has taken up his post, with an old committee. There is much speculation as to what is going to happen in the world over the next year, but the thing that really concerns me the most is.....when are the bands going to improve ?

I can remember several years ago we went through a similar dip in the ether and we were battling to hear each other. That was when we first introduced a relay, on 80m nogal, so that we could hear what the local stations were saying.

I don't know if this dip we are going through is as bad as that, but there have been times when conditions have been pretty darn awful.

El Niño has definitely had an effect on our weather patterns, but lets hope there is a change in that too and very soon. From the predictions it seems that will take place from the end of January.

So far I don't think anyone has managed to predict the band conditions and the cycles seem to be all out of kilter, but hopefully that will change soon too.

Here's to a great 2016.

Best 73

DE Andy ZS6ADY

WIKIPEDIA

Wireless Telegraphy

By 1897, Guglielmo Marconi conducted a series of demonstrations with a radio system for signalling for communications over long distances. Marconi is said to have read, while on vacation in 1894, about the experiments that Hertz did in the 1880s. Marconi also read parts of Thomas Commerford Martin's book about the inventions of Nikola Tesla and Scientific American. It was at this time that Marconi began to understand that radio waves could be used for wireless communications. Marconi's early apparatus was a development of Hertz's laboratory apparatus into a system designed for communications purposes. At first, Marconi used a transmitter to ring a bell in a receiver in his attic laboratory. He then moved his experiments out-of-doors on the family estate near Bologna, Italy, to communicate farther. He replaced Hertz's vertical dipole with a vertical wire topped by a metal sheet, with an opposing terminal connected to the ground. On the receiver side, Marconi replaced the spark gap with a metal powder coherer, a detector developed by Edouard Branly and other experimenters. Marconi transmitted radio signals for about a mile at the end of 1895.[56]

By 1896, Marconi introduced to the public a device in London and he filed a patent on his earliest system with the British Patent Office on June 2, 1896. In 1897, Marconi was awarded a patent for radio with British patent No. 12,039,[57] *Improvements in Transmitting Electrical Impulses and Signals and in Apparatus There-for.* The complete specification was filed March 2, 1897. This was Marconi's initial patent for the radio, though it used various earlier techniques of various other experimenters (primarily Tesla) and resembled the instrument demonstrated by others (including Popov). During this time, spark-gap wireless telegraphy was widely researched. In July 1896, Marconi got his invention and new method of telegraphy to the attention of Preece, then engineer-in-chief to the British Government Telegraph Service, who had for the previous twelve years interested himself in the development of wireless telegraphy by the inductive-conductive method. On June 4, 1897, Preece delivered his lecture, "Signalling through Space without Wires". Preece devoted considerable time to exhibiting and explaining the Marconi apparatus at the Royal Institution in London, stating that Marconi had invented a new relay which had high sensitivity and delicacy.

HF Happenings:

Diary

January 2016

1 – Download your copy of the 2016 SARL Blue Book
1 – New Years day; start of the 2016 CQ Marathon
3 – ARRL Kids Day
9 and 10 – Hunting Lions in the Air
10 – SARL Youth Net
13 – All schools open
15 to 17 – PEARS VHF/UHF Contest
23 – Summer QRP Contest
23 and 24 - UK/EI DX CW Contest
28 to 31 – Up the Creek Music Festival, Swellendam
31– Groote Post Country Market, Darling

February

2 - World Wetland's Day
7 - AWA CW Activity Day
10 - Ash Wednesday
13 and 14 - SARL National Field Day; CQ WW WPX RTTY Contest
14 - SARL Youth Net at 15:00 UTC on 7 070; Valentine's Day
20 - SARL Youth Sprint
22 - closing date for March Radio ZS articles
27 - West Rand ARC Flea Market
28 - SARL Digital Contest

African DX

Senegal, 6W. Marcelo, EA1HFI will be active as 6W/EA1HFI from Ziguinchor, Senegal until March. In his spare time and during the weekends he will operate QRP on SSB and digital modes. QSL via home call, direct or bureau and LoTW.
Senegal, 6W. Francis, F6BLP will be active as 6W7SK from 5 to 31 January. Activity will be on 160 to 10 metres, with a focus on the low bands, using CW with some SSB and RTTY. QSL to home call.

Morocco, CN. Jean, F5LYF is active as CN2JJ from Tiznit until March 2016. Activity is on 40, 20, 15 and 10 metres using CW and SSB. QSL to home call.

Namibia, V5. Werner, DC8QT, Georg, DD8ZX and Klaus, DJ9KM will be active as V5/DC8QT, V5/DD8ZX and V5/DJ9KM from Omaruru, Otjikoko Guest farm, Namibia, between 9 and 18 February 2016. Activity will be holiday style with a focus on 160 - 10 meters and if possible, on 6 metres. Operat-ing modes are SSB, RTTY and PSK. QSL via their home call signs.

Lesotho, 7P. Members of F6KOP Amateur Radio Club announced a DXpedition to here in February 2016. More details will be forth-coming a well as a Web page.

African Islands

IOTA frequencies

CW: 28 040 24 920 21 040 18 098 14 040 10 114 7 030 3 530 kHz
SSB: 28 560 28 460 24 950 21 260 18 128 14 260 7 055 3 760 kHz

Mauritius, 3B8. Paul, G8AFC, is once again active as 3B8/G8AFC from Pereybere until 6 April. Activity will be on 20, 10 and 6 metres on SSB. Suggested time (per Daily DX) is between 09:00 to 12:00 UTC. QSL via his home call sign, direct or by the Bureau.

Equatorial Guinea, 3C - update. Ken, LA7GIA, who was expected to be active as 3C7GIA from Malabo Island (AF-010) between 12 and 23 November and then postponed it (not cancelled), announced his plans to activate Equatorial Guinea in March 2016. Activity dates are between 4 and 13 March. Opera-tions will be on 40 - 10 meters using CW, SSB and RTTY. There is a slight chance for 80 m depending on conditions. Equipment will be a TS-480SAT with an Ameritron ALS 500m into a Mosley Mini 32 ASP (2 element beam 20, 15 and 10 m), Mosley TW 22 M (2-element beam 17 and 12 m), Hygain AV640 and G5RV 80 - 10 m wire antennas (backup). QSL via LA7GIA direct ONLY (SAE + 3 USDs). Please note, NO IRC, NO Bureau QSL. Bureau QSL will not be answered.
For updates, visit http://la7gia.com/3c7gia/index.html and Twitter https://twitter.com/KennethOpskar

VP8STI and VP8SGI

The R/V "Braveheart" has arrived in Stanley, the Falkland Islands and is prepar-ing for her 36-day voyage with the VP8STI and VP8SGI team. After camping in tents on Southern Thule, South Sandwich Islands, VP8STI, for ten days, the team will go South Georgia Island, VP8SGI, and set up camp for another ten days. Upon their return to Stan-ley, the team will operate as VP8IDX for five days with an emphasis on 160 metres. Plans are to upload the logs to Club Log on a daily basis, but the team expects to have challenges in doing so from Southern Thule, which is outside of the Inmarsat BGAN coverage footprint. QSL VP8STI, VP8SGI, VP8IDX and VP8IDX/mm via the OQRS provided by Club Log for direct and bureau cards (direct links can be found on www.intrepid-dx.com/vp8/qsl.php). Traditional cards should be sent to N2OO (for VP8STI, VP8IDX and VP8IDX/mm) and KU9C (for VP8SGI). Logs will be posted to LoTW about six months after the conclusion of the DXpedition.

History this week

(The week starting 4 January)
1704 – The first church building of the Groote Kerk congregation in Cape Town is dedicated
1789 – George Washington is elected as the first president of the USA
1838 – Samuel Morse tests the electrical telegraph for the first time
1955 – Rowan Atkinson (Mr Bean, Blackadder, Johnny English) is born
1976 – Regular TV broadcasts begin in South Africa
1990 – The Tower of Pisa is closed to the public for the first time in 800 years following fears that it will topple.

"8 GOOD REASONS FOR NOT GETTING ON THE AIR ON CW"
By Milt, K4OSO

1. **I CAN'T COPY VERY WELL** Copy skills get better with time and practice. Nerves is certainly a factor at first. The answer to nerves is exposure. Get on the air and practice those skills. After all, you're not copying vectors for a brain exploration surgery, just fun stuff. What if you do miss some? Eh?

2. **I MAKE MISTAKES IN SENDING** Who cares? Everyone does! If you show me an op who sends flawless CW, I'll eat my hat. Even keyboarders make mistakes. Its what you do when you make one that is the measure of an op. A good op corrects his mistakes. When you glide past mistakes it leaves the other guy guessing.

3. **MY CW IS VERY SLOW** Accuracy transcends speed! Accuracy is absolute, while speed will in crease/ improve over time. What you DON'T want is to get faster at sending poorly. Fast and poor are an awful two-some. Practice sending well, at a speed which is comfortable for you. You WILL make mistakes, just correct them and move on.

4. **I GET LOST IN QSO'S** As many have suggested, by writing down the parts of a typical exchange/ QSO, you will be better able to get through a QSO. Its really funny how few comments are directed to spelling. Spelling slows us down and trips us up in many QSO situations. When you practice off-air, its fine to use a sheet of text, but I find that sending as if in a QSO is much more helpful. Practice this by sending out of your head. You'll get used to sending off the cuff and your spelling will improve tremendously.
   If ragchewing is your goal, keep your exchanges short, at first. Don't try to say too much in one ex change. That way, it will give you time to think about what you'll say next, and will slow the other op down as well. That will make his transmissions easier to copy. Keep it casual, and don't let it become hard work.

5. **MY PALMS SWEAT** Keep a hand towel at your operating desk. My palms sweated on my first date too but, it didn't stop me. Remember, no one can see you! Try PRETENDING you're as calm as a cu cumber. Think of yourself as a "take charge" op who can handle any situation. As an op thinkest, so shall he be on the air.
   One particular activity that improved my confidence and ability to handle most situations was learning traffic handling on the Maryland Slow Net. Net speed was maximum 10 wpm (and flexible), the ins tructors were patient and considerate. That training gave me the confidence I desperately needed. I'm now an Instructor and Net Control Station on that Net and watch the transformation of new ops from tentative and unsure to ops who would be welcomed on NTS traffic net throughout the country. Its easy and painless and proceeds at the new op's own pace. Even if you don't become an active traffic handler, the training is invaluable for learning general operating practices.

6. **PEOPLE WILL THINK POORLY OF ME** Bull Crap!!! Everyone expects new / inexperienced CW ops to be somewhat tentative, make some mistakes and miss some copy. They expect it because THEY PERFORMED THE SAME WAY WHEN THEY WERE NEW / INEXPERIENCED. Some well-meaning ops, in an attempt to sooth the nervous new op will say, "Aw, no one will notice your mis takes" Bull crap! Of course they notice them!
   They'd have to be idiots not to. BUT, no one cares about your mistakes. This is a hobby, a means of having fun. It WILL be fun if you stop agonizing over it. The amount of fun you have at CW is inversely proportional to the amount you worry about it.

7. **I'LL DO IT WHEN I GET BETTER** that's fine if you like spending your time procrastinating. "He was gonna get on the air tomorrow" would make a unfortunate epitaph. "He really enjoyed his ham radio hobby and his CW" is a much nicer one. I waited until I was over 60 to finally get started in Ham radio. I often think of how much fun I could have had over the years if I had just bitten the bullet and jumped in. Now, I'm try-ing to make up for lost time. But, we all know that's impossible.

8. **I HAVE PROBLEMS WITH THIS OR THAT TYPE OF KEY** Ok… use whatever you're good with, and develop your skills on the others at your own pace. Whatever you do, don't try to swage your fist into a type of key that frustrates you. Learning new skills, while not easy, should be fun. Measure your progress in small chunks. Don't set your goals too far ahead. You must be able to see progress. If speed improvement is your goal, measure it one word per minute at a time. Don't try to go from 5 wpm to 10 wpm. That's doubling your speed! It would be like me trying to go from 35 wpm to 70 wpm. Never happen, go from 5 to 6. Then to 7, and so on.
   73, Milt

Soft start circuits for Linear Amplifiers

PA0FRI soft start for SB 200

A third important modification, which in my amplifier had been made by the previous owner, limits the primary inrush current due to the sudden charging of the electrolytic capacitors and slows the rise of the anode voltage. This protects the filaments and rectifier diodes and permits the use of a lower-current primary fuse.

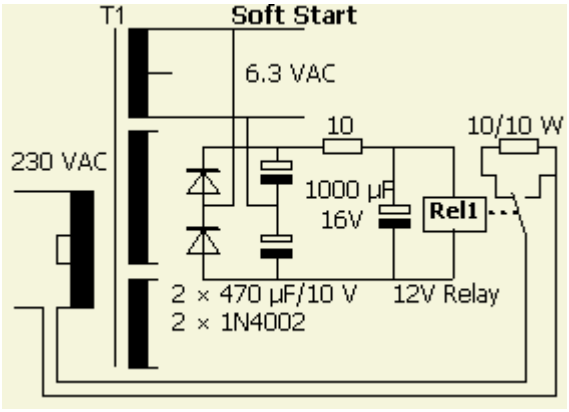
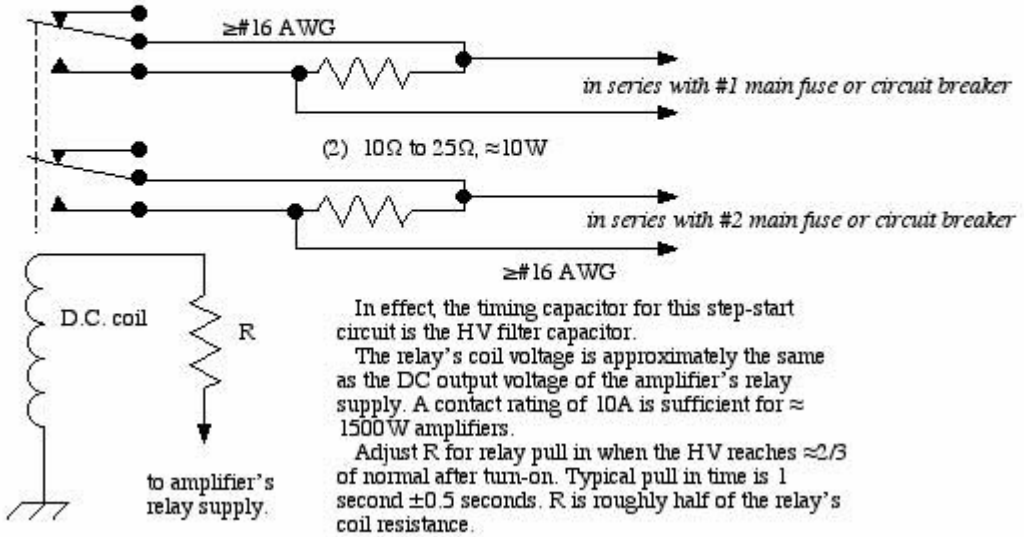


Figure 1 Step-Start

Richard L. Measures, AG6K. 6 Feb. 1994

Step-Start circuit for a typical dual-voltage operation [120V/240V] amplifier:



In effect, the timing capacitor for this step-start circuit is the HV filter capacitor.

The relay's coil voltage is approximately the same as the DC output voltage of the amplifier's relay supply. A contact rating of 10A is sufficient for ≈ 1500W amplifiers.

Adjust R for relay pull in when the HV reaches ≈2/3 of normal after turn-on. Typical pull in time is 1 second ±0.5 seconds. R is roughly half of the relay's coil resistance.

Delay switch and inrush current limiter

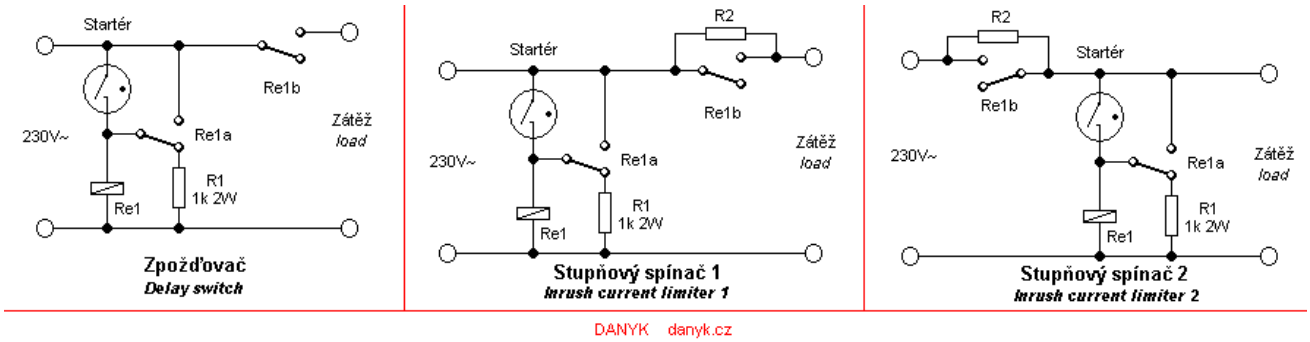
Often we need to make one appliance automatically turned with a small delay after turning on other appliances. For this purpose the delay switch (delay relay) in the schematic below can be used. The delay is ensured using starter from the fluorescent lamp that includes a "bimetallic switching neon lamp" After applying the mains voltage, the current flows through the relay (contactor) coil and R1 resistor into the starter (voltage drop at R1 is small). After a while the starter contacts are connected the relay coil gets full voltage and the relay turns on. It disconnects the resistor R1 and shorts the starter, making the relay permanently on. The second relay contact turns on the load (appliance). Resistance of R1 affects the delay time. It's 0.5 - 1s for 1k. A smaller resistance value means less time, minimum is about 330R. Increased resistance means longer time (too much resistance could cause that the relay never turns on).

The principle of the inrush current limiter (switch on surge limiter), which limits the current surge of appliances when being turned on. Some loads such as large motors, transformers or capacitors must have the inrush current limited. This can be done by switching in two stages. First, inrush current limiter connects the load to the mains via R2 (it may be power resistor, inductor, light bulb ...) and after a delay the R2 is shorted by relay contact Re1b. On the schematic diagrams below are two simple two-step inrush current limiters. The first version turns on regardless of the state of the load. R2 may be undersized as is used only briefly. The second version works with conditional switching. If there was a short circuit on the load or overload, output voltage is not large enough and relay won't turn on. In the second version R2 must be rated for continuous operation or protected by (thermal) fuse.

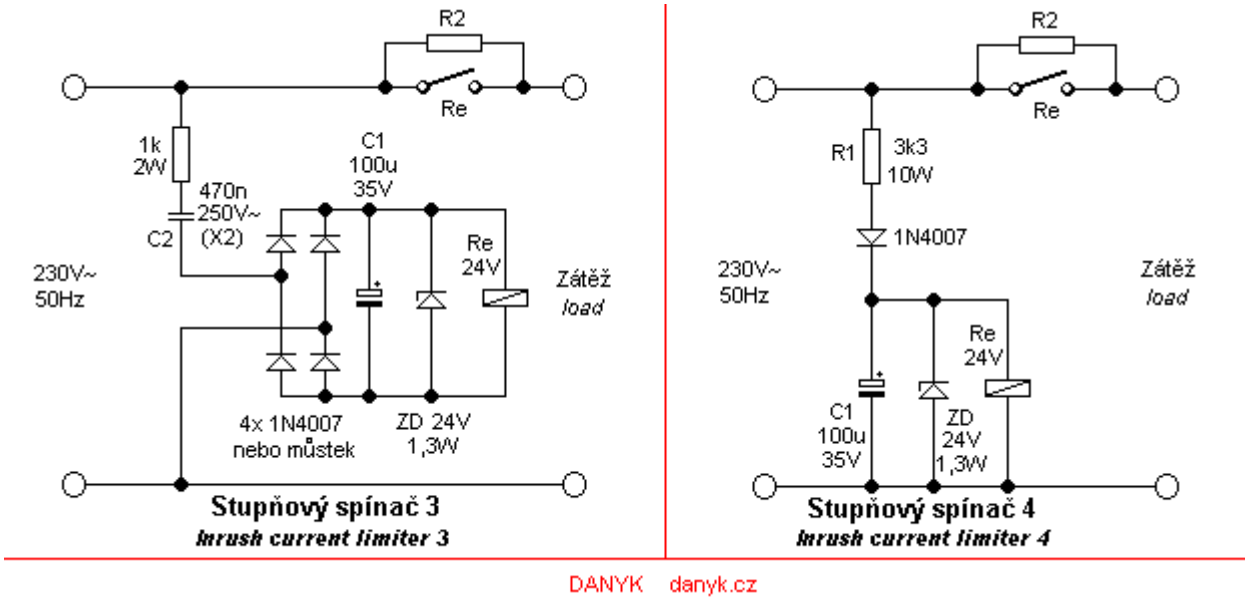
Version 3 and 4 is using a single contact relay contact and 24V coil, which may be easier to find. The time delay can be affected by the value of the capacitor C1. The schematic is suitable for relays with current up to 30mA, therefore the resistance of

the coil over 800R. In version 3, the line voltage is limited capacitively by capacitor C2 - 470n/250V~. Capacitor C2 determines the current through the relay coil. If the circuit is not permanently connected to load, to ensure its discharge after switching off, it is advisable to connect parallel resistance approx 1M/1W. In version 4 the line voltage is limited using resistor R1. The wiring is simpler than the previous version, but the drawback is a big loss at R1 (around 7W). Version 4 is inspired by Professor 700W microwave oven.

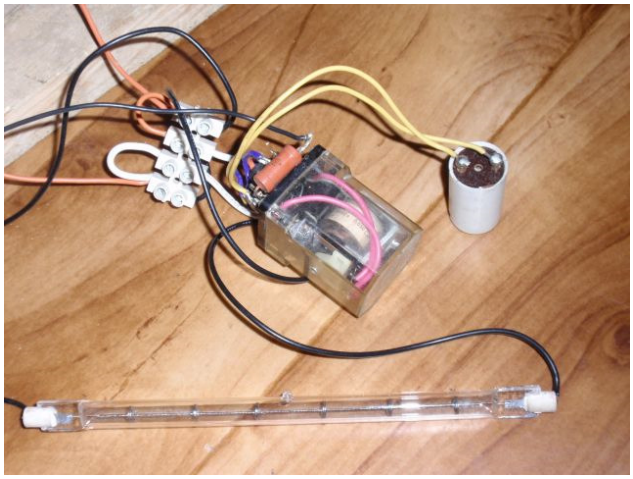
Warning, the circuit operates with hazardous mains voltage. The capacitor can remain charged to dangerous voltages even after power off. Resistor R2 may overheat and cause a fire. Everything you do on your own risk.



Delay switch and inrush current limiter schematic.



Inrush current limiter schematic with a 24Vdc coil relay.



Experimental Inrush current limiter version 1 with a 1000W bulb as the R2 limiter

Power supply Inrush protection W8JI

Let's work our way left to right through this power supply and see why certain components are used and what characteristics are important in those components.

Step Start or Inrush Limit

R7 and RLY1 make the simplest possible inrush limiter. In this system RLY1 generally has a pull-in threshold of around 70% of rated voltage. This means all primary current flows through R7 until the capacitor bank reaches about 70% of full voltage. This greatly reduces inrush. R7 should ideally be sized to limit current to maximum

safe operating current, or some amount less at your preference. If the line is 250 volts (there is no 220 in the USA, that went away in the 1950's) and the primary system safely tolerates 15 amps at worse case load, we would want R7 to be at least 250/15 = 16.7 ohms. Use the next highest standard value or more if you prefer. If you use too much resistance the amp will not reliably close RLY1.

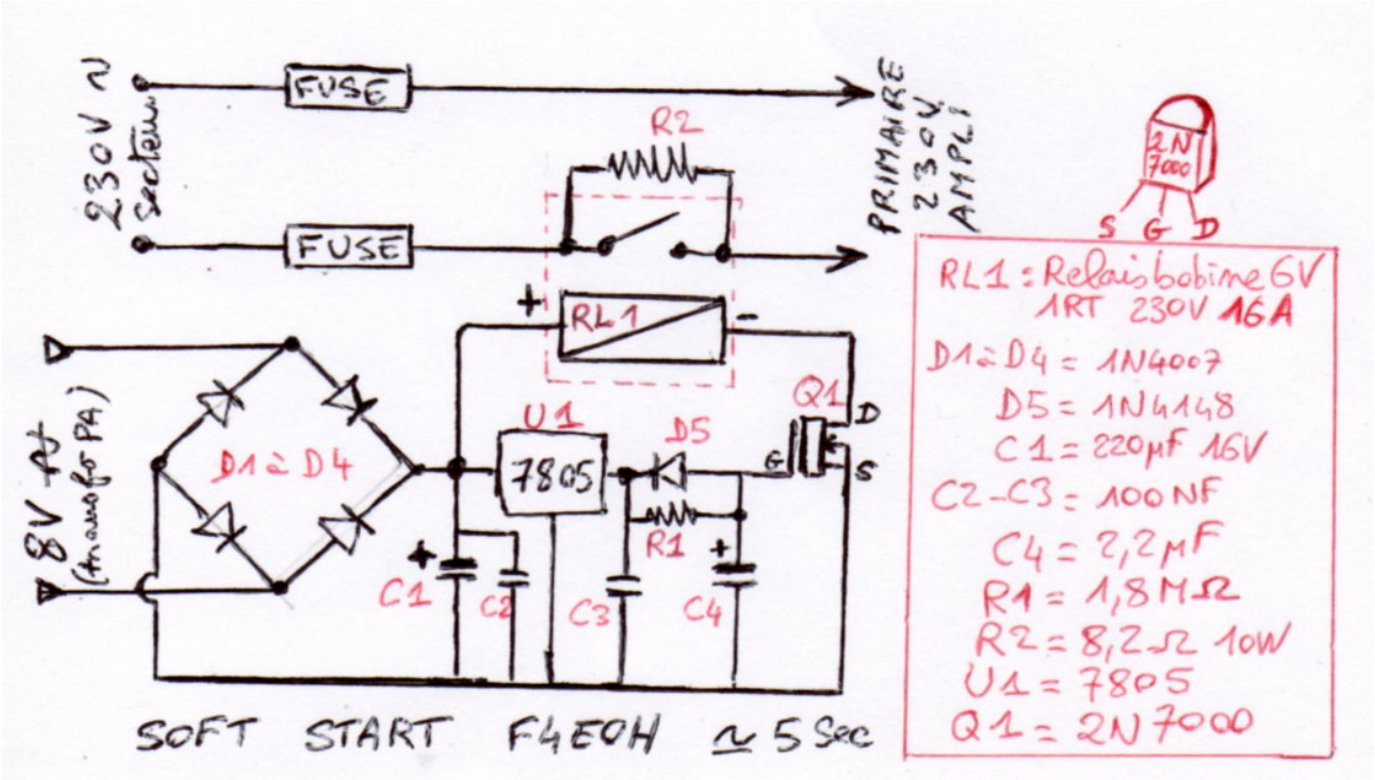
Let's say we use 20 ohms with 240 volts. On switch closure when the primary looks like a near-short, inrush would be 12 amperes. If the supply was loaded with more than 1000 watts load before RLY1 closes, the relay may not close. Because of this it is a good idea to use an energy storage or pulse rated resistor that handles significant surges without failure, and to fuse the resistor (**fuse is NOT shown**) with a modest current fuse. Typically a 2-amp slow blow fuse will handle a 10-amp inrush system for the short duration of R7 current. Size the fuse as small as possible consistent with the fuse not opening on normal starts.

The system below is a 120V system.
Whatever you do in a high-power variable-load capacitor input supply, never put the inrush protection or limiter as a fixed resistor in the primary or secondary!
A capacitor input supply operates with very high apparent power factor. Any resistance pre-filter capacitor will dissipate far more heat than most people expect, and will also cause a much larger voltage drop than expected.

An ultra simple SOFT START: F4EOH

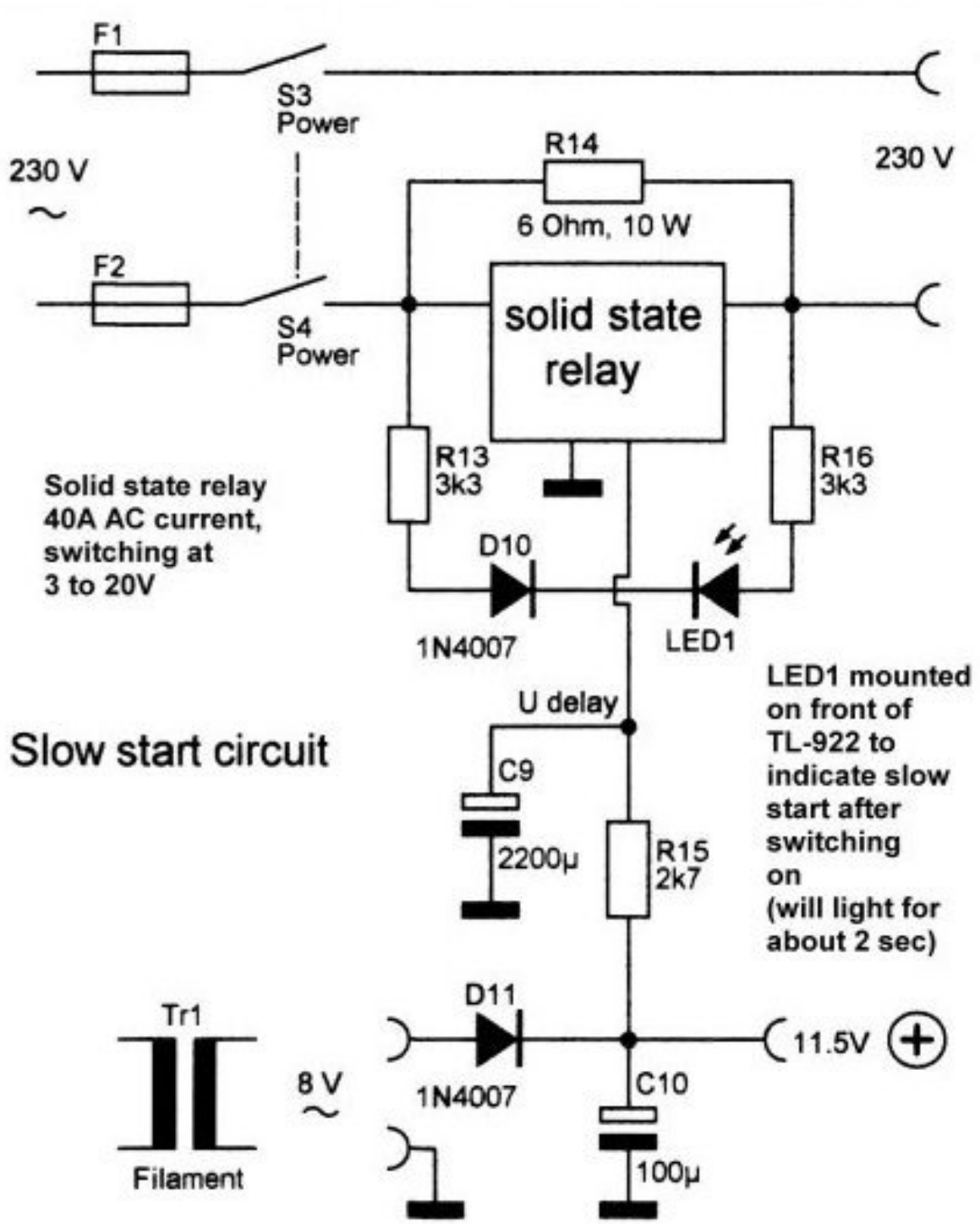
The goal is to insert a low-ohmic power resistor in series in the primary during the first few seconds (or there is the biggest current draw). A simple timer with a 2N7000 FET closes a power relay after 5 seconds, which bypasses this resistance, by 8.2 ohms (not critical). The relay is powered by the secondary 8v found on the filament transformer, then rectified, filtered. Although a 12v relay is the case, a relay whose coil 6V frankly glue is better in practice. When the relay is closed, the voltage across the coil is 7.5V, which is perfect. Here, a 1RT relays with 16A 250V AC have been selected, but you can put two 10A 250V AC relay in parallel ...

Here is the schematic and list of components:



Slow start circuit DF5KF

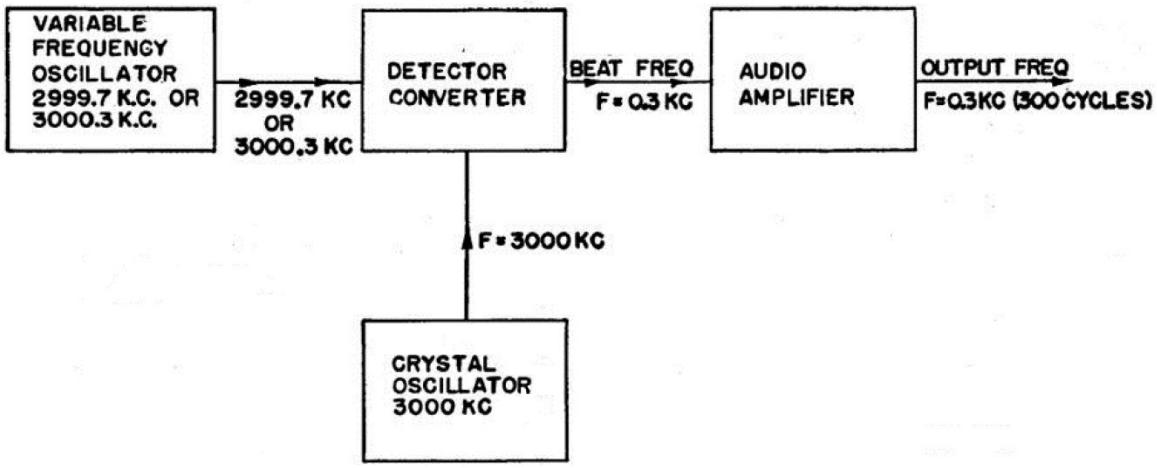
A slow-start circuit may protect the tubes, capacitors and prevent the household mains fuses to blow when the TL-922 is switched on. The slow start circuit is built as shown here:



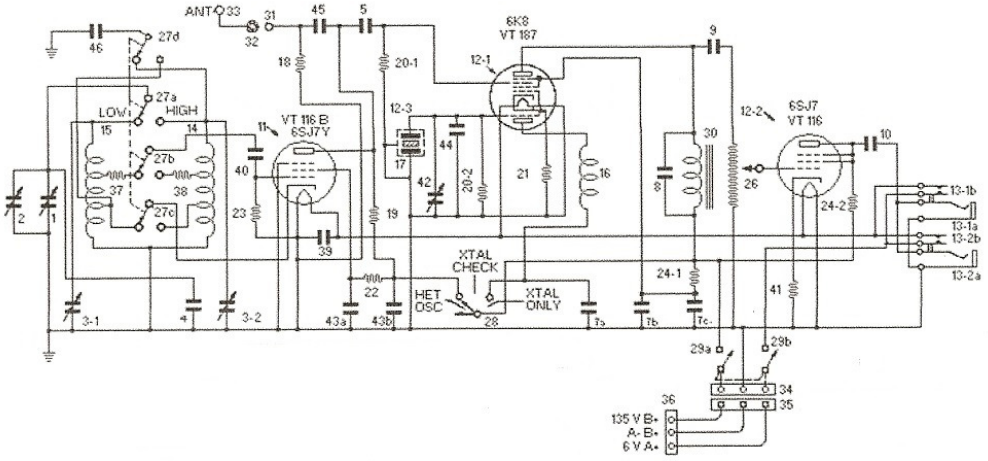
I used a solid state relay (cheaply acquired at a hamfest) which was mounted on the rear side of the TL-922. To make sure that the circuit works properly (i.e. relay shorts resistor R14) I provided a bright red LED with rectifier diode and shunt resistors. The LED indicates the voltage across the solid state relay. The LED was mounted on the TL-922 front near the on/off switch. The LED shows for about 2 seconds after switching on. In case of failure of the solid state relay the LED will not shut off. In this case the PA must be switched off manually to prevent R14 overload.

"10 WAYS TO "UPCYCLE" YOUR BC221
by Richard ZS6TF AWA historian

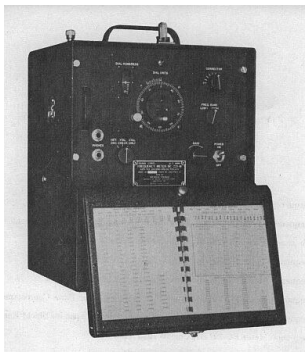
The BC221 (SCR211) is a Precision, portable, self-contained, heterodyne frequency meter designed in 1940 to measure or radiate radio-frequencies between 125 kHz and 20 MHz in two switched ranges: 125 to 250 kHz and 2 to 4 MHz. The 2nd, 4th and 8th harmonics of the low-frequency range are used to cover 250 kHz to 2 MHz, while the 2nd, 4th and 5th harmonics of the high-frequency range are used to cover 4 MHz to 20 MHz. Originally portable power was provided by dry batteries giving 135 volts B+ and 6 volts for the heaters, housed in the lower rear compartment since it was designed to calibrate radio receivers and transmitters in the field. After direct comparison with the crystal-calibrated variable frequency oscillator within the instrument, the variable frequency is converted from the Vernier dial reading using a calibration book unique to each meter serial number.



Each meter contains a 1 MHz quartz crystal oscillator circuit which is used both as an external source of accurate radio frequency signals at harmonic multiples and internally for calibrating the variable frequency oscillator of the instrument at a number of points. These points of frequency calibration are called "Crystal Check Points".



There are two flavours of BC221, a black crackle finished aluminium-alloy cabinet and an olive drab wooden cabinet with a khaki canvas cover.



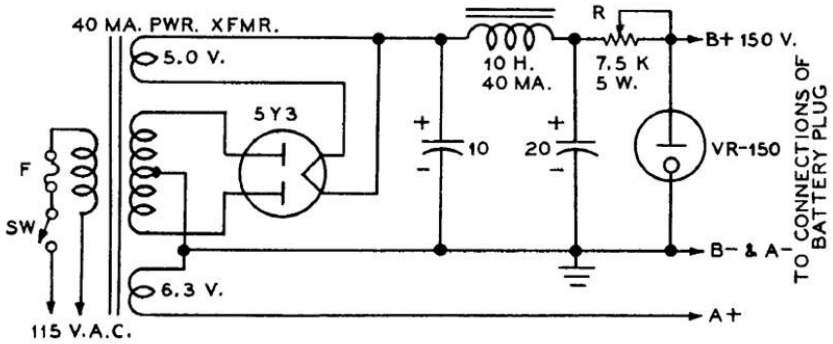
The BC-221 became the post WW2 'gold standard' for amateur frequency measurement when thousands were released onto the surplus market in the late 1950's and early 1960's permitting frequency checking of amateur transmissions to an order of accuracy of 0.002% or better, meaning 74Hz in the centre of the 80M Band or 600Hz at the top of the 28MHz Band. There is a plethora of models denoted by a single suffix letter A to T or pair of letters AA to AL. All however are similar in basic operation differing in minor details, each suffix denoting a different US Government order and often the manufacturer. Units with suffix AK and AL have an additional position on the function switch allowing modulation of the VFO at around 400Hz.

Antique test equipment is the "Cinderella" of Boat anchor culture as modern handheld direct reading devices can do the job better. However it would be hard to imagine in 70 years time the latter devices being revered for their aesthetics and exceptional mechanical design in the same way the BC221 is increasingly recognised today reflected in the rising prices for pristine, working and unmodified examples. Assuming you have a BC221 or motivated to acquire one, what can you do with it? Here are some suggestions.

1. Hug it! This form of passive conservation for example as a shack display item is entirely acceptable and far better than the doorstop option or forming part of a bottom support layer for a boat anchor accumulation at the back of the shed or even the shed itself.

2. Download & read the part of the technical manual TM11-300 applicable to your version(http://www.w7ekb.com/glowbugs/Military/BC221pages.html) with intent to prove you can operate it. This doubles up as part A of the (cognitive) test for Alzheimers.

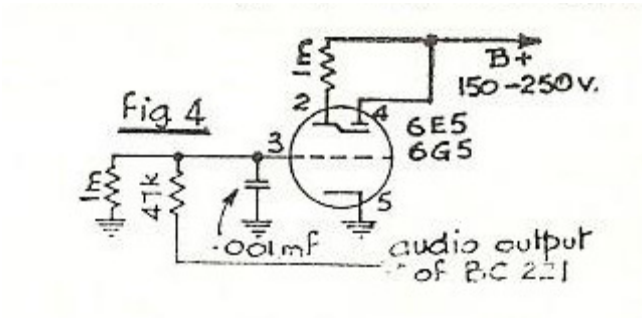
3. Build (or improve the previous owners efforts) a mains PSU to fit into the battery compartment space. This is a fantastic introductory challenge to the world of boatanchory that no newly licenced amateur should pass up, as his fresh multiple choice question RAE does not equip him to do this.



This circuit has passed the test of time but there are a few niceties that some broad-brush oldtimers might omit, gloss over or have forgotten. The Neon regulator tube type VR150 (VR150/30 or civilian type 0D3) is a gas filled discharge valve that exhibits a near constant voltage across the valve for currents within the range 5mA to 40mA. The regulation is 150 plus or minus 5.5 Volts. The series resistor should be selected and adjusted with the BC221 as a load until the current from the cathode pin of the VR150 to ground is approximately 15mA. If you selected your components from other people's junk boxes, you made the chassis from aluminium stock sheet, the unit fits in the compartment AND it works, you will have complied with part B (Spatial concepts) of the Alzheimers test.

As a bonus you will be ready to use the BC221 to test a boat anchor transmitter or receiver. Purists might want to remove the risk of AC on the heaters polluting the zero beat in the headphones with 50Hz by building a DC supply for the heaters using a 12 volt secondary instead of 6.3v or winding a few more secondary turns on the transformer to boost the 6.3 volts, a 7808 regulator, and a series diode or two to bring the heater voltage to within 5% of 6.3 volts nominal. You will have to design this yourself cribbing a public domain schematic. If successful you have the ultimate proof that you do not have Alzheimers, having passed test part C (Abstract concepts) With flying colours.

4. To improve the accuracy of the instrument by a factor of 10 is within the reach of most amateurs who have got this far ie ability to use it as is. The stabilisation of both the plate and heater supplies both of which affect frequency, described above will already have helped. The sources of errors are given in the manual and the September 1965 QST article by W4AWY(on the AWA website) addresses each one plus the idea of graphing the interpolation points over the ham bands is a nifty suggestion and will give hours of fun. The LF response of the AF amp is relatively poor, likewise the operators ears. Errors in null detection can be eliminated completely with a magic eye add-on published in August 1963 Radio ZS (also on the AWA website). Since you have to wire up from the PSU to power it up, how about the height of "cool" by bringing the neon regulator out as well and mount it horizontally facing forward alongside the magic eye in a set top black crackle box. The pink glow with purple edges of the VR150/30 will double up as an "on/off indicator and will contrast nicely with the ethereal green of the magic eye as it winks at each beat point.



5. The BC221 is de facto a direct conversion receiver when it is used to zero beat on external signals to determine their frequency. If you connect the unit to a decent antenna you can often hear strong local signals and by juggling the heterodyne even resolve SSB. A pre-selector for the BC221 gives gain and selectivity sufficient to use the BC221 as a reasonable receiver.

QST Nov 1962
Lew McCoy W1ICP

Note: Add a choke on J2 to ground.

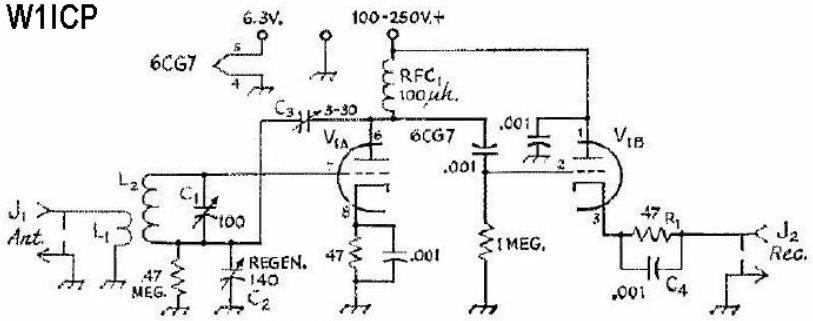


Fig. 1—Circuit diagram of the preamplifier. Resistances are in ohms; resistors are ½ watt. Fixed capacitors are 0.001-μf. disk ceramic.

C1—100-μμf. variable (Hammarlund APC-100-B).
C2—140-μμf. variable (Hammarlund APC-140-B).
C3—C-30-μμf. mica compression trimmer
C4—0.001-μf. disk ceramic.

J1, J2—Phono jacks.
L1, L2—See Fig. 4.
R1—47 ohms, ½ watt.
RFC1—100 μh. (National R33, Millen 34300-100).

50 turns for L2 and 3 turns on a 20mm former for the coupling link L1 antenna input results in a high Q coil with plenty of coverage from approximately 3 to 6 MHz.

6. Use the BC221 as an audio oscillator. Simply beat the VFO with the crystal calibrator and voila.

7. Use the BC221 VFO as a VFO for a transmitter project. There are several anecdotal examples of this having been done at Rugby and Alexandra palace transmitters after the master oscillators failed so to use it as such without modification is easy as it puts out up to a volt at the antenna terminal. Due to the prolific number of harmonics in the output at least a low pass filter is required and better still a Pi coupler will give you an impedance transformation to the next stage. A very comprehensive webpage by K4CHE on front ending a transceiver project with a BC221 without modification of the unit is at http://k4che.com/BC221/BC221pg1.htm

So far the BC221 has been used without internal intervention. Any internal work is likely to invalidate the calibration. Due to the screening, external access to internal wiring points is virtually impossible without irreversible modification. From here on the option should only be applied to units that have been "got at".

8. A logical extension and challenge is to use the BC221 as a QRP CW rig on 7020kHz on the AWA CW net. 2 milliwatts into a matched antenna, keying the B+ if you are brave enough, but grid block keying is recommended if you are going for your DXCC.

9. Use the BC221 as a domestic AM broadcast transmitter. The suffix AK and AM versions are provided with crude modulation by turning the AF stage into an oscillator and switching it into the VFO plate circuit. A small change to this set up by removing the feedback wire and injecting audio to the AF stage via a 0.1 mF capacitor would produce low level AM for the purpose. The circuit could be cribbed for other models and the LF response improved by the addition of a cathode capacitor to the AF stage of at least 2 mF.

10. If all else fails follow the disposal instructions in the manual.

Or better still advertise it for sale in the AWA newsletter or on the Website.

DESTRUCTION NOTICE

WHY — To prevent the enemy from using or salvaging this equipment for his benefit.

WHEN—When ordered by your commander.

HOW — 1. Smash—Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools, etc.

2. Cut—Use axes, handaxes, machetes, etc.

3. Burn—Use gasoline, kerosene, oil, flame throwers, incendiary grenades, etc.

4. Explosives—Use firearms, grenades, TNT, etc.

5. Disposal—Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT

WHAT—1. Smash—Oscillator ceramic coil forms and all other parts on underside of chassis of frequency meter after removing chassis from cabinet by loosening holding screws on front panel.

2. Cut—As many wires and cables as time permits.

3. Bend and/or break—Calibration dial and knobs on front panel of frequency meter.

4. Burn—Calibration books, manuals, circuit label, and remainder of entire frequency meter.

5. Bury or scatter—Any or all of the above pieces after breaking.

DESTROY EVERYTHING

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Headquarters, Hartford, Conn.

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Dues paid up to and including April 30, 1924.

The American Radio Relay League, Inc.

May 24, 1923. (Date)

Hiram Percy Maxim President.

Secretary.

(This is not an appointment as Official Relay Station. Such appointments are made direct by Division Managers in charge.)

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Notices:

Net Times and Frequencies:
Saturday 05:00—AM Net—3615
Saturday 07:15—Western Cape SSB Net— 7140 (Alternate 3630)
Saturday 07:30—KZN SSB Net—7150
Saturday 08:30— National SSB Net— 7140; relayed on 14135 beaming to WC and on Echolink (ZS0AWA-L)
Saturday 14:00— CW Net—7020
Wednesday 19:00— AM Net—3615, band conditions permitting.